



RESOURCES

Some findings and conjectures from
recent research into resource development and use

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Resources are living phenomena, expanding and contracting in response to human effort and behavior.—ERICH W. ZIMMERMANN
in *World Resources and Industries*

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“THE ROUGHER THE COUNTRY . . . ”

“**A**PPROACHING EAST KENTUCKY from the Bluegrass,” said Dr. Mary Jean Bowman, speaking informally before an RFF staff seminar recently, “the Knobs and the escarpment back of them are conspicuous. As you ascend this escarpment, the rich farming land of the Bluegrass seems suddenly remote and you enter a country of depleted forest lands and a rural poverty in almost unbelievable contrast to the white-fenced horse farms only a few miles away.”

What word best states the condition and situation of this mountain crescent and its people? she asked. “Backward? Call it that, and you’d better start home right away!” In order to spare the feelings of the people trapped in such sagging sectors of the economy, “underdeveloped” has become the acceptable usage. But is that always precise enough to convey the facts? She has her doubts.

True enough, this area has many earmarks of what is commonly called underdevelopment—lack of heavy industry, low income per person, unstable employment, and high birth rates. But to take the word literally is something else again. “If by underdevelopment we mean a major gap between the economic potential of an area and its realized economic levels, then it is not at all clear that East Kentucky is underdeveloped.”

Miss Bowman is professor of economics at the University of Chicago. She made the East Kentucky study with the support of RFF funds. She is now drafting her findings and interpretations. Until that is done, she is not prepared to offer any final conclusions, although she already has definite ideas on the



nature of the problem and the direction of realistic steps for alleviating it.

EAST KENTUCKY is the Jesse Stuart country, a land of clambering crests, backwaters, coves and hollows, roads that often come to a dead end (some of the infrequent rail lines do, too), patch farming, and marginal mine pits. Early industries—salt mining and iron-workings—have long since vanished; the forests are logged over; coal mining, fifty years ago the bright hope of the mountain area, has contracted sharply, and faces an uncertain future. But in population this lean hill country still is booming; there is heavy out-migration but also a fertility rate that is by far the highest in Kentucky and when job opportunities fall off in the great cities there have been heavy tides of back-migration. With each year’s flood of babies and each pause in economic expansion elsewhere, the unemployment gap in East Kentucky becomes a heavier burden.

“THE ROUGHER THE COUNTRY”—so a mountain saying runs—“the closer folks stick to it.”

Even if the old saw is no longer literally true, it still suggests the difficulties of breaking out of a long-established pattern.

The stock remedies—attract outside capital, develop new industries—can help comparatively little, Miss Bowman believes, recalling her doubt that economically the region is truly underdeveloped. It is essential to face up to these limitations. They mean continued high out-migration. They mean also that for a long time to come the mountains will be subsidized in one way or another by state and federal government—even with continuing out-migration. Thus, she notes, the question is not whether the area should be subsidized, but whether the form of the subsidies will merely aggravate the disease while concealing some of the symptoms, or will contribute to a cure.

Along with the highest fertility rate in the state, East Kentucky spends the smallest percentage of local income on education. Nor is any other section so disadvantaged with respect to transportation and communication, or so aware of a distinctive identity. Above all, East Kentucky stands out for its cultural and economic isolation. "De-isolation and improved education are the keys to policy."

New through highways and other closer contacts with the world outside not only would encourage some new economic activity, but also—which seems much more important—would bring the mountain communities into more active participation in the national life.

"People are and for some time will be East Kentucky's most important export." However, in their new setting the emigrants are often only marginally employable and consequently more likely than others to be unemployed. "In addition to their claims on direct public assistance they add to other costs of government at these destinations quite out of proportion to their numbers. There is clearly a national interest in investment in the education of the mountain people."

Timing is important. Policies that might be justified at one time might not at others: the situation must be ripe for chain effects on

attitudes and behavior that affect the economic and cultural life of the community. In this connection, Miss Bowman suggested that "the floods of 1957 may have marked a turning point."

In sweeping away hundreds of ramshackle houses along the river bottoms the floods "achieved essential demolition without benefit of economic calculation. . . . In their wake came a surge of activity on the part of both local and state leaders." Through their efforts and the conditions of federal assistance, a return to pre-flood patterns has been prevented. Local pride and determination have found increasingly active expression. For example, at private expense a road has been built to the top of the mountains that hem the town of Hazard in its flood valley. It leads to a modern motor lodge that is attracting tourists. Some of the more prosperous families are building their homes along this road, safe from floods. Until then, "it had been categorically asserted that the terrain forced people to crowd into the river bottom."

Perhaps East Kentucky is at present peculiarly "ready" for the kind of long-term help that encourages more active participation in the national life and also fosters proud self-help in building people and communities for the future.

This is "development," though not what is usually meant by "economic development."

HERE, THEN, is an instance of how a question of semantics—exactly what is an underdeveloped area?—has a practical bearing on the understanding and solution of a real and crucial situation. Harvey Perloff of the RFF staff recently recognized the same problem from the national view. Low-income sections of the country, he told members of the American Economic Association, "have quite different potentialities for economic growth and improvement. Some have natural resources that have yet to be fully tapped; some have locational advantages for attracting industries; others, however, have to face up to their very limited potentialities for economic expansion and to the urgent need for a high rate of out-migration." In the title of his paper, "Lagging Sectors and Regions of the American Economy," Perloff comes up with an adjective—*lagging*—that covers a range of situations yet lacks the sting of "backward." His paper, issued as RFF Reprint No. 19, is drawn from materials in a recent book by him and three colleagues, *Regions, Resources, and Economic Growth*.

The Adaptable Indian



THE ABORIGINAL METLAKATLA was located on the Tsimshian Peninsula in British Columbia and was abandoned when its people moved in a body to take up residence outside the Hudson's Bay Company post at Fort Simpson. There in 1857, William Duncan, a lay representative of the Church Missionary Society of London, found them in a tragic state of degradation, but within a period of only four years of intensive missionary work had somehow persuaded them not only to complete the break with their aboriginal past, but to turn their backs upon the easy and morally loose way of life of the white men and return to the site of their

former homes. George W. Rogers tells the story of these people in his book *Alaska in Transition: The Southeast Region*, to illustrate the proved ability of the Indians of the Region to adapt themselves to changing social and political conditions. Quoting Aurel Krause (1882):

"The move under Duncan's leadership constituted a complete break with their past on the part of all the participants. . . . Each man had to build his own house, not according to the customary plan of Indian houses, but like European dwellings. . . . To cover the cost of administration a tax was levied which could be paid in money, woolen blankets or other

goods. . . . In 1878 Metlakatla possessed its own schooner which made regular commercial trips to Victoria, a community warehouse, a merchandise store for alien Indians, a soap factory, a smithy, a sawmill, a schoolhouse which cost about four thousand dollars; a large building for public assemblies . . . a church, a woolen mill, a rope and cord factory, a tanning establishment, a shoe factory and much else."

Krause continues: "For alien tribes who visited the new colony for trading purposes, a special structure was set up so that the visitors would not soil the dwellings of the colonists. After their departure, the space occupied by them was thoroughly cleaned and fumigated." Rogers cites this as an indication of the degree to which the Metlakatlans had become Mid-Victorian Englishmen, and completes their story:

Following a dispute with the London missionary authorities, Duncan was replaced as the representative of the society, but his flock refused to accept the new leadership and once more they migrated, eight hundred strong, to Annette Island, Alaska, in 1887. For a second time they started from scratch to create a model village. By an Act of March 3, 1891, the United States Congress created Annette Island Reservation which provided the community with an adequate resource base to support itself. The village continues to exist as the largest and most stable Indian village in the Region . . . with the highest per capita income. Currently it is sharing the economic pains of the general crash in the fisheries, however.



THE INDIANS, with more than a quarter of the population, still constitute an important segment of the Southeast Region's human resources. . . . With depletion of the salmon resources which provided the primary basis for their old way of life, the Indians' predicament will not be resolved

merely by a change in policy orientation in managing the Region's remaining resources. As far as the Indian is concerned, if this broad policy shift [from Territory to State status, from nonresident to resident orientation, and from a primary fisheries economy to one drawing upon the Region's plentiful forest resources] is to achieve its intended social goals, it must be accompanied by a shift in Indian cultural and economic patterns. Former employments will not suffice. New job opportunities, based upon exploitation of other natural resources, must to a large extent take their place. The Indian's economic survival, even under this new and presumably more favorable order, depends upon his willingness and ability to adapt his ways, no less than upon the white man's willingness to accept him as an equal partner on these new terms.

Excerpted from Alaska in Transition: The Southeast Region, published earlier this year by The Johns Hopkins Press.



Reservoir Evaporation Losses

THE STEADILY EXPANDING reservoir capacity of the United States is not all gain for water supply. The extended water surfaces that have been created have an undesirable accompaniment in loss of impounded water by evaporation. Part of the vaporized water may return as rain, but this will seldom occur in the region from which the water came. The permanent supply of the region thus falls short of its potential. Average gross annual losses through evaporation may be as high as 7 feet of water depth. Under severe drought conditions, evaporation of 10 feet of water in a year may occur. In terms of total volume lost from artificial reservoirs in the United States, over 20 million acre-feet have been estimated to evaporate per year. In the eleven western states, annual evaporation losses exceed 11 million acre-feet. . . .



In recent years, control of evaporation from these open-water surfaces has been seen as a tempting source of water not otherwise available. In achieving such control it has been clear that if the reservoir surface can be protected from the sun, the large evaporation losses which occur in regions of high insolation can be eliminated completely. . . . But the raw water evaporated from artificial lakes, like those formed by dams across canyons and ravines, does not have sufficient value to bear the very large cost of a structural cover. . . .

Although the basic principles of vaporization reduction, through the use of insoluble liquid films on water surfaces, have been known for at least thirty years, it was not until about 1952 that substantial progress was made toward applying them. Certain types of organic chemicals having molecules containing a long hydrocarbon chain terminating in an alcohol group, acid group, or some other radical compatible with water (hydrophilic group), will form an invisible, insoluble film only one molecule thick on a water surface. The rod-like molecules orient themselves vertically side by side, with the hydrophilic group downward toward the water and the hydrocarbon chain forming the new surface. Because of the extreme thinness of the film, a minute quantity of the added compound will completely cover a large water area. Moreover, these compounds have such low volatility and solubility in water that the film may be remarkably permanent.—Edward A. Ackerman and George O. G. Löf in RFF's *Technology in American Water Development*, The Johns Hopkins Press, 1959.



Passages

ON TARIFFS . . . A tariff increase on lead-zinc in all likelihood will require us as a nation to use up more productive power to produce the lead and zinc we consume than would be true if we produced exports with which to purchase a part of it. The very purpose of a tariff increase is to enable firms to survive that would otherwise close down. . . .

There is, however, another question: Are we or foreign producers going to bear the burden of reducing output when demand falls cyclically? A specific duty [a fixed amount per pound] increase will tend automatically to shift this burden toward our foreign suppliers. That is, as price goes down, the size of the duty relative to price increases. . . . A sliding tariff, under which the specific duty would be increased as price goes down, would carry this effect still further. . . . This country does have a selfish interest in foreign miners. We cannot afford to do very many things that reduce their level of well-being, for retaliation is possible. A nation in the position of the United States will not make friends abroad by attempting to export cyclical unemployment.—*Orris C. Herfindahl, in a lecture given at the Colorado School of Mines.*

CONSERVATION no longer expresses a self-contained and self-justifying purpose; resources have become means to ends as diverse as growing proteins, living urbanely around cities, and winning international security.—*Henry C. Hart in Perspectives on Conservation*

THE HAZARDOUS CRYSTAL BALL

ALL OF THE GREAT changes in energy use over the past century, writes Sam H. Schurr in a new RFF study, "have made possible essentially new, or enormously improved, ways of performing important economic and social functions. They have accomplished this always in combination with other changes—railroads, automobiles, electric motors, etc.—themselves often made feasible by changes in energy sources or their form.

"The change in the energy base from wood, a limited resource, to coal, which was available in apparently endless amounts, opened the way to the large-scale growth of iron and steel metallurgy. Adequate supplies of iron and steel, in turn, made it possible to revolutionize transportation by building a railroad network. The way was also opened to the ever-expanding production of machines constructed of metal which have provided the foundation for our modern industrial system. Not only did coal support the necessary growth in metals production, it also supplied the large amounts of fuel needed to power locomotives and the machines of industry . . .

"In the Twentieth Century, liquid fuels have been fundamental to the growth of automotive transportation, whose impact on the American way of life is beyond any need for description. The impact of electricity is without parallel. It has made possible numerous developments in the field of communications and automatic controls which would otherwise be inconceivable. Also, in industrial

plants the substitution of electric motors mounted on machines for the older system in which mechanical energy was transmitted by belts powered by a single prime mover has made possible a complete reorganization of production practices."

In these and other ways cited by Schurr, what first appeared to be a simple substitution of an improved form of energy for an older one has time and time again touched off a whole chain of far more significant—and utterly unpredictable—developments. This is one of the reasons why he and his colleagues in their forthcoming study have limited their forward projections to 1975, just fifteen years from now. It is also the reason why they have little to say about atomic energy whose chief peaceful use, from *present* indications, is as a substitute fuel for generating electricity not likely to be economic on any large scale in the United States by 1975. But that only is as things look now. The record of the past does not encourage dogmatism. "It may be," Schurr speculates in mentioning a few of the really long-range possibilities, "that at some date in the distant future nuclear fuels will be looked back upon as the energy source without which the revolutionary transportation system of the space age would have been totally impossible."

From the introduction of Energy in the American Economy, 1850-1975, by Sam H. Schurr and Bruce C. Netschert in collaboration with Vera F. Eliasberg, Joseph Lerner, and Hans H. Landsberg, to be published in November by The Johns Hopkins Press.

Kate Lord, whose drawings have done so much to give *RESOURCES* a distinctive appearance, died last July. Through the kindness of her husband, Russell Lord, who is editorial consultant for the publication, we shall continue to draw upon the large backlog of her illustrations of natural-resource themes.

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